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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,310	07/07/2003	Jerry R. Kukulka	PD-01-946/11827 (21797-00)	8247
7590	11/14/2006		EXAMINER	
Carmen Santa Maria McNees Wallace & Nurick LLC 100 Pine Street P.O. Box 1166 Harrisburg, PA 17108-1166			TRINH, THANH TRUC	
			ART UNIT	PAPER NUMBER
			1753	
DATE MAILED: 11/14/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/614,310

Applicant(s)

KUKULKA ET AL.

Examiner

Thanh-Truc Trinh

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 8-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 11/09/2006.
- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C.

121:

- I. Claims 1-7, drawn to a product, classified in class 136, subclass 243-265.
- II. Claim 8-15, drawn to a method, classified in class 438, subclass 48-98.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made.

The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by different methods such as electroplating.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

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During a telephone conversation with the Applicant's representative, Mr. Carmen Santa Maria, on 11/03/06 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-7. Affirmation of this election must be made by applicant in replying to this Office action. Invention of Group II is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Application is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3-5, 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Kressel et al (US patent 4070206).

Regarding claim 1, Kressel et al disclose a solar cell structure 10 comprising semiconductor layers 18, 22, 20 in facing contact with each other to form P-N junctions 24 and 26. (See Fig. 1, 3 and col. 2 lines 33-49). Shunts (or pocket region) 28 and 30 extend between and at least through two layers of

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semiconductor layers, and comprise of altered material. (See Fig. 1, 3, and col. 3 lines 2-7).

With regards to "having an asymmetric current-voltage characteristic...", it has been held that a newly discovered use or function of component does not necessarily mean the system is unobvious since this use or function may be inherent in the prior art. *Ex parte Pfeiffer* 135 USPQ 31.

Regarding claim 3, Kressel et al teach that the shunts (or pocket regions) 28 and 30 are made of the same conductivity type of one semiconductor layer but with higher dopant concentration. (See col. 3 lines 2-7). In other words, the altered material is a doped altered material.

Regarding claim 4-5, Kressel et al disclose that the solar cell comprises more than two semiconductor layers, wherein the shunt 28 extends between and at least partially through two of the semiconductor layers, and shunt 30 extends between and at least partially through three of the semiconductor layers. (See Fig. 1 and 3).

Regarding claim 6, Kressel et al disclose that the solar cell comprises plurality of channels spaced apart from each other over a front-side surface of the solar cell. (See Fig. 1 and 3).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kressel et al in view of Merritt et al (US patent 4926083).

Kressel et al disclose a solar cell structure with a shunt that is used for transporting current comprises a channel of an altered material as described in claim 1.

Kressel et al do not teach the altered material is a proton-irradiated altered material.

Merritt et al teach that a preferable way to confine the propagating charge is proton implant by bombardment (or irradiation). (See col. 1 lines 46-55, or col. 3 lines 3-7)

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the structure of Kressel et al by having proton implant on the conducting channel, because it would reduce leak in propagating current by creating a semi-insulating area surrounding the channel.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kressel et al in view of Solar Panels website ([www-stud.fht-esslingen.de/projects/alt\\_energy/sol\\_cells/solar\\_panel.html](http://www-stud.fht-esslingen.de/projects/alt_energy/sol_cells/solar_panel.html))

Kressel et al disclose a solar cell structure as described in claim 1.

Kressel et al do not teach interconnecting solar cells.

Solar Panels website teach interconnecting solar cells in series and parallel. (See website [http://www-stud.fht-esslingen.de/projects/alt\\_energy/sol\\_cells/solar\\_panel.html](http://www-stud.fht-esslingen.de/projects/alt_energy/sol_cells/solar_panel.html))

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the structure of Kressel et al by electrically interconnecting plurality of solar cells, because it would increase voltage output, amperage output to a desired level. In addition, the choice of putting solar cells in series or parallel, based on the effectiveness and practicality, is typical and well known.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh-Truc Trinh whose telephone number is 571-272-6594. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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